

## **SPECIAL OPERATIONS FORCES LASER ACQUISITION MARKER (SOFLAM) PEQ-1C** written by: John D. Gresham, Defense Media Network on May 27, 2010

**2001 - Afghanistan** - An odd-looking box resembling a slide projector proved to be one of the decisive weapons of Operations Enduring Freedom in Afghanistan during 2001 and Iraqi Freedom in 2003. Under the Pentagon's Joint Electronic Type Designation System, electronic boxes get a three-letter code followed by a sequence number. "P" means man-portable. "E" means laser. "Q" means "special or combination." Meet the Northrop Grumman PEQ-1C; first of



its kind, third modification, better known as SOFLAM. Used by Special Operations teams, SOFLAM enables a spotter on the ground to precisely direct bombers, strike fighters, attack helicopters or artillery with an invisible beam of laser light.

Air Force Combat Controllers illuminating targets for air strikes in Afghanistan with SOFLAMs in 2001.

The "forward air control" problem is easily explained, though often dynamic and complex. A spotter on the ground sees a distant target on his visual horizon, normally at a low angle. A pilot in the air

sees the same target from high above, usually among a clutter of distractions. The ground controller is stationary, while the pilot rides a moving platform, and is distracted by the work of flying the plane and avoiding ground fire. Thus when controller and pilot communicate purely by voice under the stress of combat, there is much risk of confusion and potentially tragic error. A laser target designator helps to eliminate the confusion. Simply put the laser beam on the target, and a seeker in the nose of a laser-seeking missile, bomb, or artillery shell can "acquire" the laser spot, lock onto it, and maneuver to hit it. Laser designators operate in the infrared part of the spectrum (wavelength between 0.7 and 300  $\mu\text{m}$  or micrometers) so the beam is invisible to the naked eye.

The enemy doesn't want to be hit. So the art of the forward air controller is to find a spot on the battlefield where he can clearly see the target while remaining concealed. Special operations forces are very good at this, but to do their job they need gear that is as light, compact and rugged as possible. Early models of the SOFLAM used a "flash lamp" to pump the laser, and this power-hungry component required five heavy batteries. The PEQ-1C uses a solid-state, passively cooled diode-pumped laser, which requires only a single BA-5590 battery, and increases overall system reliability. Normally the PEQ-1 is mounted onto a small tripod, and often covered with a camouflage scarf or tarp, so that enemy observers have a harder time trying to locate this distinctive piece of equipment.

SOFLAM can also be used as a laser rangefinder, since modern electronics can measure time down to nanoseconds (billionths of a second). Knowing exactly when a pulse left the device, and

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when the reflected beam returned to the detector element in the optics, simple math gives distance to the target, which is displayed to the SOFLAM operators. This allows SOFLAM to help controllers create GPS coordinates for weapons like JDAM, Excalibur, and guided MLRS and ASTAMS. These can be manually produced by figuring range and bearing from a handheld GPS unit and radioed to a launch platform or artillery battery. SOFLAM can also automatically produce calls for fires and airstrikes by connecting the PEQ-1's data ports to GPS and radio systems. These calls can then be entered digitally into a system like the Advanced Field Artillery Tactical Data System (AFATDS) by controllers, delivering ordnance sometimes in a matter of minutes.

First delivered in the late 1990s, the PEQ-1 saw its combat debut in the fall of 2001 in Afghanistan. In the hands of Air Force Combat Controllers and Special Forces soldiers ("Green Berets"), SOFLAMs were a key tool in bringing America's massive airpower to bear against the elusive targets of al Qaeda and the Taliban. At key battlegrounds like Mizar-al-Sharif, Kunduz, and Bagram, SOFLAMs were the key to putting ordnance precisely onto enemy targets, often at "danger close" ranges from friendly troops. Eighteen months later, SOFLAMs again made their precision felt in hundreds of attacks against Iraqi forces during Operation Iraqi Freedom. Since that time the PEQ-1 has become something of a classic piece of SOF equipment, treated much like a rifle or radio in the eyes of the "quiet professionals." And while the present PEQ-1C SOFLAM is a bit bulky and heavy, it is a massive improvement on earlier systems. Given the present-day limitations on solid-state laser technology and its need for power, plan on seeing SOFLAM around for some years to come.

### PEQ-1C Specifications:

- **Weight:** 11.3 Pounds (5.2 kg)
- **Size:** 11.2 x 13.2 x 5.2 in. (28.5 x 33.6 x 13.1 cm)
- **Operating Temperature Range:** -32 degrees to +49 degrees C (-30 degrees to +120 degrees Fahrenheit)
- **Battery Power:** 24 VDC, Lithium or Rechargeable NiCad
- **Laser Wavelength:** 1.064  $\mu\text{m}$
- **Pulse Energy:** 80 millijoules
- **Operating Range:** 200 to 19,995 meters
- **Optics:** 10x magnification, with a 5 degree field of view